Term	Topic content
Gonorrhea	Gonorrhea is a human contagious disease, caused by Gram-negative aerobic diplococcus *Neisseria gonorrhoeae,* which is predominantly sexually transmitted. **Historical information.** The modern term «gonorrhea» was firstly used in the II century AD by Galen, who mistakenly took discharge from the urethra of men as seminal fluid (from Greek, *gonos* is semen, *rrhoea* is discharge). The inflammatory process in gonorrhea is usually limited to urinogenital organs, accompanied by release and subjective disorders. The possible are also gonococcal lesions of mucous membrane of the rectum, moth cavity, nose, throat, tonsils, and conjunctiva and very seldom by generalization of infectious process. **Etiology.** The causative agent of gonorrhea is Gram-negative aerobic diplococcus *Neisseria gonorrhoeae,* discovered by A. Neisser in 1879 Gonococcus belongs to the family *Neisseriaceae,* to the genus *Neisseria.* Coccus has got the shape of coffee beans, with concave surface facing each other, with the length of 1.25 to 1.6 microns and 0.7-0.8 microns across. Gonococcus is a complex organized prokaryotic cell, with cell wall, cytoplasmic membrane, cytoplasm, consisting of ribosomal and poly-somal complexes and nucleoid. The outer three- layer membrane of gonococcus is composed of lipooligosaccharides, pili and three types of proteins. Gonococcal pili are essential for the attachment of the bacteria to the surface of various cells, such as spermatozoa, erythrocytes, mucosae epithelium. Electron microscopy studies of gonococcus ultrastructure revealed the presence of capsule substance, which prevents intracellular digestion of gonococcus and promotes incomplete phagocytosis. Gonococci stain well with all aniline dyes and discolor provided the use of Gram's stain (they are Gram-negative), what distinguishes them from the other diplococci. **Pathogenesis.** Gonococci parasitize only in human organism and affect predominantly the cells of columnar epithelium of urogenital tract, rectum, and eyes. Due to pili gonococci are quickly fixed on the surface of epithelial cells, within 24-28 hours penetrate into the intercellular gaps, and then into the subepithelial tissues, where they form microcolonies. Due to the destruction of the epithelium gonococci have got access to the

	superficial lymphatic and blood vessels of the genitals. In the result of canalicular and lymphatic dissemination, new sections of mucous membranes of genitals are gradually involved into the inflammation. Gonococci do not proliferate in stratified squamous epithelium and in the acidic vaginal environment, so vulvovaginitises are more common in girls and women after the onset of menopause. The possible are the lesions of rectal mucosa, conjunctiva and pharyngonasal cavity. The skin seldom is involved into the pathological process. The interaction of gonococcal infection and mucous membranes of various organs is determined by different anatomical, physiological, immune and hormonal characteristics of the organism associated with the age and sex. Gonorrhea, like other sexually transmitted infections, is an anthroponotic infection. The causative agent quickly dies outside the human body. Introduction of infection occurs primarily through sexual contacts. Contagiousness of gonorrhea for women is much higher than for men. The period, which is necessary for the development of the inflammatory response, is usually called the incubation period. On average the incubation period of gonococci is 3-10 days, but its duration may vary within wide limits. Then there appear the clinical signs of the disease, the main manifestation of which is purulent discharges from the urinogenital organs. Phagocytic reaction in gonorrhea depends on the reactivity of the organism and the intensity of the production of endotoxin by gonococci. The course of the infection process is defined by the ratio of complete and incomplete phagocytosis. In the phagocytic reaction the polymorphonuclear leukocytes PMNL, macrophages, lymphocytes and epithelial cells are involved. Acute gonorrhea is characterized by incomplete phagocytosis involving predominantly polymorphonuclear leukocytes. Between them (PMNL) and macrophages there exists the co-operation, in which the partially lysed gonococci together with the broken ones are captured by macrophages, which carry phagocytosis to completion. After the disease a true post-infectious immunity does not appear. After the recovering, in case of new contact with gonorrhea sufferer, the reinfection is possible. In addition to reinfection, superinfection is possible, which usually appears in the presence of encysted lesion focus. Recurrence of gonorrhea usually occurs in the period of the first

two weeks or during one month after the end of the treatment. Gonococci are located predominantly inside the cell and have a tendency to transformation. Reinfection occurs most frequently in 2-3 months after the end of the treatment and is accompanied by acute or subacute inflammatory process.

Epidemiology. According to WHO data, the incidence of gonorrhea in the world is about 65 million cases per year. High incidence of the disease is contributed by the characteristics of the modern course of the disease, such as increased number of asymptomatic, oligosymptomatic and chronic forms, accompanied by immune disorders and various complications. Currently, the course of gonorrheal infection is complicated by a number of peculiarities, in particular, the growing number of penicillinase-producing strains of gonococci and reducing sensitivity of the pathogen to antibacterial drugs, an increased frequency of mixed infection. Social meaning of gonorrhea is defined by the high level of morbidity and the rapid development of complications.

The source of the infection is patients with gonorrhea often with the asymptomatic or low-symptom forms of the disease. The main way of infection is sexual. Infecting through sexual partners, in case of oral-genital contacts leads to the development of gonorrheal tonsillitis, and in case of genital-anal contacts leads to gonorrheal proctitis. Nonsexual infection is possible through direct contact (in the result of entry of discharge onto the mucous membrane of the eyes, mouth cavity and rectum when passing through the birth canal, the issue on possibility of intrauterine infection is under discussion). Indirect nonsexual infection occurs in case of very close household contact of a small child with a sick mother via a common bed and hygienic or toilet articles.

Classification. In the domestic clinical practice classification of gonorrhea is based on the duration of the disease. Distinction is made between *recent gonorrhea* with the duration of the pathological process of up to two months, and *chronic gonorrhea* with duration of more than two months. Depending on the severity of the clinical manifestations the recent gonorrhea is divided into *acute*, *subacute* and *torpid*. There is also latent gonorrhea (gonococcal carriage), in which the presence of

	the pathogen in the mucosa does not cause any inflammatory reaction. When infection gets into the blood circulation disseminated gonococcal infection may develop. According to the International Classification of Diseases (ICD-10) there are different forms of gonococcal infection with indication of the localization process. **Clinical manifestations of gonorrhea in men.** Gonorrhea in men occurs predominantly in the form of destruction of urethra that is urethritis. The clinical signs of the disease are characterized by the appearance of pain during urination and suppurative discharge from the urethra of different degree of intensity. Depending on the clinical manifestations urethritis can be *acute, subacute, torpid* and *chronic.* ***Recent acute gonococcal urethritis.*** Acute inflammation of the urethra is characterized by edema and hyperemia of the urethral sponges, abundant purulent yellowish green discharge from the urethra during the whole day, lancinating pains during urination. *Acute anterior gonorrheal urethritis* is characterized by the inflammatory reaction of the mucous membrane of the distal part of the urethra, pain appears at the beginning of urination, and in case *of acute total urethritis,* when inflammation covers the whole urethra, pain increases at the end of urination (this is the sign of urethrocystitis). Total urethritis is often accompanied by the frequent urgency of urination (up to 15-20 times a day), painful erections and emissions. In the case of pronounced inflammation, the purulent discharge becomes bloody, there appears hemospermia. With time acute inflammation without treatment can move into the *subacute stage* or initially urethritis can be characterized by moderately pronounced clinical signs. In this case, the swelling and hyperemia of urethral sponge are weakly pronounced. Discharge in the form of moderate or insignificant purulent or serous-purulent release occurs mainly in the morning after overnight break in

	urination. Feeling of pain during urination is characterized as insignificant. Manifestations *of torpid (asymptomatic) urethritis* follow the subacute stage, and can also appear at the beginning of the disease. If the patient does not consult a doctor in time, if he did not receive appropriate treatment or the therapy was irrational, if he self-medicated, drank alcohol and ate spicy food, did not interrupt sexual contacts, then inflammatory process becomes chronic. ***Chronic gonococcal urethritis.*** Clinical signs of chronic urethritis are mild itching during urination, insignificant discharge, which occurs in the morning or when pressing on the urethra. Chronic gonorrheal urethritis, as well as the recent one, can be *anterior and posterior,* though it is rare limited by the anterior urethra and has got usually a total character. As a rule there are no complaints in chronic gonorrhea, the possible is a slight itching or burning sensation in the urethra. In the morning if pressing at the external opening of the urethra a small drop of yellowish or turbid discharge can be seen. The discharge often is so insignificant, that it does not form a drop, but dries up and agglutinates the sponges of the external opening of the urethra. In many cases the discharge has such a viscous consistency that it stays in the cannel and can be found in the form of filaments only during visual examination of urine. Chronic gonorrhea generally has a torpid course with periodic exacerbations. ***Clinical manifestations of gonorrhea in women.*** Gonorrhea in women is characterized by the oligosymptomatic course and multifocal lesions. These features are associated with the anatomical features of female genitourinary organs. In women, gonorrhea affects the cervical canal, urethra, vulvovaginal glands and rectum, in girls, vulvovaginitis develops, the development of proctitis is possible in the result of leakage of purulent discharge from the vagina. Gonococcal lesions in women can appear at the same time in several places (urethritis, endocervicitis, etc.) and be not accompanied by significant subjective sensations. There are the following clinical varieties of gonorrheal infection in women: *gonorrhea of the lower genitourinary tract,*

	these are urethritis, bartholinitis, vestibulitis, vulvitis, vaginitis, endocervicitis, *gonorrhea of the upper genitourinary tract or ascending gonorrhea* — gonococcal endometritis, salpingitis, oophoritis, pelviperitonitis. Depending on the duration of the disease there are recent and chronic gonorrhea, and on the activity of the clinical symptoms there are acute, subacute, torpid and latent gonorrhea. ***Gonorrhea of the lower genitourinary tract*** Gonorrheal urethritis in women in its clinical manifestations reminds the same disease in men and is characterized by pain and a burning sensation during urination. With the spreading of the infection along the urethra there appear the symptoms of urethrocystitis, dysuria in the form of frequent and painful urination. Intensity of symptoms in women can be quite variable, but it is observed that the incidence of *torpid and asymptomatic* forms is significantly higher than in men. In the setting of *recent acute gonorrheal urethritis*, the urethral sponges are hyperemic and swollen, after the massage of the urethra a drop of matter is discharged from its external opening. In case of recent torpid and chronic *gonorrhea*, the hyperemia and edema can be absent; during palpation the infiltration is discharged along the urethra. *Vaginitis (vulvovaginitis)* occurs in girls, pregnant and menopausal women in the setting of the corresponding hormonal features. In adult women the phenomenon of vestibulitis and vaginitis can develop in presence of acute gonorrhea in case of the overlay of secondary infection (Staphylococcus, Escherichia coli). There occurs a lesion of squamous epithelium with desquamation and erosion of mucosa, resulting in the observed clinical manifestations. Acute process is characterized by the presence of heavy discharge, pain, burning sensation and itching. The walls of the vagina are edematous, hyperemic and painful. With torpid and chronic course of vulvovaginitis the clinical manifestations can be less pronounced or absent. *Bartholinitis* is inflammation of the large vestibular glands. The process typically occurs on both sides. The clinical picture is determined by the degree of dissemination of inflammatory process. The lesion can be limited by

excretory duct, cover completely the gland, fall outside its bounds. In case of disorder of outflow of gland secretion, the false abscess can be formed, which does not cause abnormality of general condition and breaks spontaneously after some time. In case of joining of the secondary infection there is meltdown of the gland wall with the spreading of inflammation over the surrounding tissue and with the formation of true abscess. This condition is accompanied by the appearance of symptoms of intoxication, disorder of the general condition, sharp painfiilness of lesion focus.

Endocervicitis is an inflammation of the mucous membrane of the cervical canal. Columnar epithelium lining the cervical canal is affected in the first place. With acute and subacute process, the purulent discharge from the cervical canal promotes maceration of the stratified squamous epithelium of the vagina, which leads to the appearance of leucorrhea. On examination in mirrors hyperemia and edema of the vaginal part of the cervix, the erosion of the external os, purulent discharge from the cervical canal are determined. In the case of a chronic course of the process, the discharge is minor or absent, the cervix can be deformed, there are erosions on the surface of the cervix at the external os, while taking the material the bleeding is not rare.

Gonorrhea of the upper genitourinary tract Ascending gonorrhea in women can have the following clinical forms:

- *Genital*, these are endometritis, salpingitis, salpingoophoritis, pelviperitonitis;
- *Extragenital*, these are proctitis and pharyngitis.

Endometritis is a consequence of an ascending infection from the cervical canal, leading to the lesion of the mucous membrane of the body of uterus. In the case of an acute process the colicky lower abdominal pains appear, the body temperature raises to 39 ° C, there are abundant sanies, and disrupted menstrual cycle. In chronic process, there are dull lower abdominal pains, periodic spotting, gaping cervix and scanty, mucopurulent discharge.

Salpingitis is an inflammation of the uterine tubes. During the dissemination of the
inflammatory process over the ovaries, there occurs salpingoophoritis. Acute inflammation in this area is characterized by the pronounced lower abdominal pains amplifying at movement, urination and defecation. There are symptoms of intoxication, temperature rise up

	to 39 ° C, disruption of the fecal masses formation, menstrual irregularities, and more frequent urination. The chronic process is accompanied by moderate pain in the iliac region, menstrual irregularities, and scanty mucous secretions. Salpingoophoritis can cause infertility due to the blockage of uterine tubes, the development of connective tissue in the result of the inflammatory process in the area of the appendages. Chronic inflammatory process of this localization can cause ectopic pregnancy. *Pelviperitonitis* is a serious complication of gonococcal infection associated with inflammation of the pelvic peritoneum. It is characterized by sharp colicky lower abdominal pains. There appear dyspeptic phenomena, constipations, bloating, and disorders of urination. The body temperature is increased up to 39 ° C, there are symptoms of intoxication, anterior abdominal wall is tense in palpation, and there is positive Blumberg symptom, in a clinical analysis the EST is increased with normal amounts of leukocytes of blood. *Gonorrheal proctitis and pharyngitis* are the forms of extragenital gonorrhea. Gonorrheal proctitis occurs in girls and women in case of leaking of purulent discharge from the vagina or in anal variant of sexual contacts in people of both sexes. Acute gonorrheal proctitis is characterized by pains during defecation, itching in the anus area. In the case of the formation of erosions and cracks blood can appear in the feces. The anal area is hyperemic, in the folds the matter is accumulated. There can be no complaints in recent torpid and chronic forms, and the signs of the inflammation in the form of hyperemia, swelling and erosion of the mucous membrane of the rectum are only detected in rectoscopy. Gonococcal pharyngitis and tonsillitis occur as the consequence of oral-genital contacts and have not got the characteristic differences from other inflammatory processes of this localization. The diagnosis is set only on the basis of the results of bacteriological examination.

	Gonorrhea in girls results from the nonobservance of hygienic norms in time of direct contact with adults with gonorrhea or through transferring infection by means of household items. The girls of older age can catch a disease at attempt of sexual contact. A distinctive feature of the inflammatory process, associated with anatomical and physiological characteristics of the girls, is the simultaneous lesion of external genitals, vagina, urethra, and often rectum as well. *Disseminated gonococcal infection* occurs in the case of penetration of the agent in a blood channel, favored by the destruction of the mucous membrane of the primary focus of infection. Gonococci in blood usually die under the influence of factors of natural immunity. However, in some cases, getting into the blood stream, gonococci are able to multiply and enter in various organs and tissues, causing lesions of joints, endocardium, liver, meninges, skin. The course of disseminated gonococcal infection does not depend on the nature of the primary site and the virulence of the organism. Dissemination occurs in case of long-lasting undetected infection, improper treatment, immunedeficiencies of different nature, menstruation, pregnancy, lesions of mucous membrane at instrumental manipulations and sexual contacts. Disseminated gonococcal infection has severe and mild form. Severe form occurs with pronounced signs of intoxication, such as fever, chills, tachycardia. Polyarthritis is typical with the purulent joint effusion; in case of skin lesion there are predominantly vesicle-hemorrhagic rashes with necrosis. With severe form, sepsis can develop, followed by endo-, myo- and pericarditis, meningitis, hepatitis. With mild form the lesion is limited predominantly to knee-articular syndrome. *Gonorrheal arthritides* in their clinical manifestations are similar to other bacterial inflammatory lesions of the joints. The presence of the primary site of infection and detection of gonococci in the articular cavity confirm the diagnosis. *Gonococcal eye lesions* are frequent manifestation of gonococcal infection in adults, which develops as a result of mechanical transfer of the pathogen from the genital organs to the conjunctiva. Gonococcal conjunctivitis, iridocyclitis, gonococcal ophthalmia in neonates occurs during infection when passing through the birth canal, or in utero. The cases of transmission of infection from the medical personnel are casuistical. The incubation period lasts from 2 to 5 days. In case of intrauterine infection the disease is pronounced

	in the first day of life. Gonococcal conjunctivitis is characterized by edema and hyperemia of eyelids, photophobia, and abundant purulent discharge from the eyes. In the absence of treatment the process extends to the cornea, causing swelling, infiltration, turbidity and ulceration. Neonatal ophthalmia occurs in the case of penetration of infection in the area of the inner shells of the eye. The occurring ulcer with subsequent cicatrization can lead to blindness. Modern peculiarities of gonococcal infection lie in the fact that gonorrhea occurs predominantly as a mixed infection. With that the clinical manifestations, periods of incubation can change, complications can develop, etc. **Complications of gonococcal infection.** The characteristics of anatomy of the urethra in men lead to a number of peculiar morphological changes caused by the migration of lymphocytes, neutrophils, and plasma cells in lesion focus. As a result an inflammatory reaction develops that is clinically manifested in the formation of subepithelial cellular infiltrate. The formation of urethra infiltration causes destruction of elastic tissue. Destruction of elastic fibers starts quite early and develops in proportion to the intensity of inflammation. With chronic gonorrheal urethritis the further development of changes occurring in the acute stage is observed. It is not always possible to provide a clear pathologicoanatomic demarcation between acute and chronic inflammation, because the transition from one process into another is slow and gradual. The epithelium of the urethra is subjected to the further metaplasia and gets the tendency to keratinization. Inflammatory cellular infiltrate in the mucosa and submucosa of the urethra tissue acquires a pronounced focal character and is gradually replaced by connective tissue. Depending on the degree of cellular infiltration and the presence of connective tissue in the focus of inflammation there are two pathohistological groups of urethrides. The first group includes gonorrheal urethritis, characterized by prepotency of cellular infiltration (soft infiltrate) in the presence of insignificant amount of connective tissue. The second group consists of urethritis with a solid infiltrate, in which the predominant element is the connective tissue. Such infiltration is observed in cases of chronic gonorrhea. Along with the changes in the mucosa and submucosa of the urethra, there are also significant changes in the urethral glands and crypts in the form of deposition of connective tissue in or around the crypts and littritis gland.

	Complications of gonococcal infection include: *Littritis* is inflammation of alveolar tubular glands located in the urethra. When overlapping the opening of the glands by inflammatory infiltrate they can take the form of dense painful knots (pseudo abscesses), perceptible on palpation. Sometimes pseudo abscess reaches a considerable size, the periurethral abscess can appear in case of purulent dissolution. *Morganite* is an inflammation of the Morgagni's lacunae, as well as littritis, is a complication, which occurs most frequently in gonorrhea and has got similar clinical manifestations. *Tysonitis is* an inflammation of Tyson glands located on both sides of the penis frenulum. They are defined as inflammatory nodules on palpation. While squeezing the glands there can be the purulent discharge from the excretory ducts. Also, abscess of gland is possible, in case of ductal blocking. *Parauthretitis* is an inflammation of the paraurethral cannels, which in the acute phase is masked by manifestations of urethritis. Isolation of the pathogen in the paraurethral canals can cause a recurrence of gonorrhea. Parauretrit manifests itself as infiltration in the projection of paraurethral duct and hyperemia of the ostium of discharge opening. When closing openings the lacunar abscess can be formed. *Periurethritis* develops as a result of penetration of gonococci in the periurethral tissue and the corpus cavernosum of urethra. Periurethritis looks like infiltrate with indistinct contours, which can cause abscess formation, the curvature of the penis, urination disfunction with the subsequent formation of urethral strictures. *Colliculitis* appears during the propagation of the inflammatory process in the area of seed tubercle and manifests itself as a painful syndrome of different severity, radiating to the lumbar region, hips, lower abdomen, and genital organ. Colliculitis is often accompanied by sexual disorders in the form of premature or late ejaculation. There

	are catarrhal, interstitial and atrophic colliculitis. *Cowperitis* is an nflammation of the bulbourethral glands. The clinical picture of acute process is characterized by throbbing pain in the perineum, increasing during defecation, movement and pressure, more frequent or difficult urination. Fever up to 38°C and chilly sensation is typical from the general phenomena. Chronic cowperitis is characterized by heaviness and aching pain in the perineum, increasing during prolonged sitting, periodic discharge from the urethra, mainly in the morning. *Prostatitis* is the most common complication of gonorrhea. Prostate infection occurs in lesion of the posterior urethra by gonococci. Catarrhal prostatitis appears in case of limited lesion of the prostate ducts. With involvement of lobules gland in the pathological process the follicular prostatitis develops, and in the case of the dissemination of the pathological process in the parenchyma, there occurs parenchymatous prostatitis. *Vesiculitis* is an inflammation of the seminal vesicles, often combined with prostatitis. The acute form is not frequent and is characterized by the common occurrences of intoxication, fever, haematuria and haematospermia. The more frequent is chronic vesiculitis, which can be asymptomatic and is revealed at clinical and instrumental examination. During exacerbation there appear pelvic pains radiating to the urethra, perineum, rectum, painful pollutions, haematospermia and premature ejaculation. *Epididymitis* is an inflammation of testicular appendage. Typically, the process is of unilateral nature. Gonococcal infection is the most common cause of this condition. Antiperistaltic movements of deferent ducts promote the development of epididymitis. Along with the appendage the deferent duct (deferentitis appears) and the tissue surrounding the spermatic cord (fiiniculitis) are involved in the inflammatory process. Acute process is characterized by the development of the common phenomena of intoxication, fever, increasing temperature up to 39-40 ° C. In the setting of the pain syndrome there appear hyperemia and edema of the corresponding scrotal half. At the same time there are the clinical signs of acute total urethritis with the presence of discharge and dysuric phenomena. The increased and painful appendage of testis in the form of a helmet is detected on palpation, which covers testis over its back and bottom surface. At the beginning, the

	inflammatory process is localized in the tail of the epididymis (testicular appendage), and only then spreads to the body and head of the epididymis. With that the testis itself can remain unaltered. It is often that epididymitis initially has subacute or torpid course without common phenomena and with indistinct clinical picture. Chronic epididymitis is a final phase of acute inflammatory process. Epididymoorchitis leads to fibrosis and cicatrization. This can result in cicatricial obstruction of deferent duct and the formation of obstructive infertility. *Balanoposthitis and phimosis* occur more frequently in the presence of a long and narrow foreskin. The clinical manifestations of these complications do not differ from the similar in case of disease of non-gonococcal etiology. **Diagnose.** Clinical diagnostics includes history and complaints taking, inspection and collection of material for laboratory examination. *When taking history and complaints,* it is necessary to clarify the period since the sexual contact with supposed source of infection to the appearance of subjective symptoms, as well as whether the sexual partners were examined by the specialist and what diagnose is set to them. *Visual examination* includes the inspection of the skin and visible mucous membranes, hair part of the head, neck, trunk, extremities, genitals and perianal area for excluding skin diseases and other infections, mainly sexually transmitted. It is necessary to palpate all groups of superficial lymph nodes, such as submandibular, supraclavicular, inguinal, popliteal, for excluding regional lymphadenitis. In women the abdomen, greater vestibular and paraurethral glands, urethra are palpated, a bimanual gynecological examination is carried out. In men it is necessary to palpate the urethra, the prostate gland (prostate massage is contraindicated in acute process), bulbourethral Cowper's gland and organs of scrotum. Palpative examination is performed to exclude associated pathology and for clinical assessments of the affected organs. For establishing the diagnosis of gonorrhea the laboratory data are of decisive importance. The etiological diagnosis is established on the basis of *bacterioscopic and bacteriological methods of examination.* The material for

	the study can be discharge of urethra, cervical canal, conjunctiva, the secretion of sexual glands, swabs from the rectum, the lacunae of tonsils, back of the throat. Discharges for the analysis are taken by the Volkmann's small spoon or a special bacteriological loop. Sampling from the different foci is aimed to the efficiency and specificity of diagnostic methods. At urethral inspection the material is taken no earlier than 4 hours after urination, otherwise discharge can be rinsed off by urine. Taking into account the prevalence of mixed forms of infection the diagnostics of other sexually transmitted infections must carried out concurrently. For *microscopic study* the discharge of urethra, cervix, cervical canal is taken by the Volkmann's small spoon or special bacteriological loop and placed it onto the glass slide. Two preparations are to be prepared simultaneously for the two staining methods; these are the Gram's stain and methylene blue method. At this, it is necessary to take into account that Gram's stain has the basic differential diagnostic meaning. Gonococci are discolored during the Gram's staining (Gram-negative), that distinguishes them from other diplococci. At the same time it is necessary to make cultural research. Given the high sensitivity of gonococci to drying and thermal exposure, it is recommended to seed immediately to the culture medium for the isolation of gonococci. The stained preparations are placed under microscope with immersion. The characteristic location for gonococci is inside the white blood cells (endocytobiosis), especially in case of acute forms of gonorrhea; in case of chronic gonorrhea, the agent can be both intracellular and extracellular. When establishing the diagnosis of gonorrhea in pregnancy, teenagers and children, as well as in case of sexual violence the cultural research is obligatory irrespective of the results of the microscopic examination. *Modern nonculture methods of identification of gonococci*, such as nucleic acid amplification methods have high sensitivity and specificity, with allows using them for screening in the study of clinical materials obtained by non-invasive methods. But, in the case of detection of *N gonorrhoeae* by these methods in any clinical materials the culture diagnostics must be carried out with identification of agent, which allows determining the sensitivity to antibiotics. With this, molecular-biological methods of research allow to carry out diagnostics of several sexually transmitted infections simultaneously. *Serological methods* in diagnosing of gonorrhea have got no significance. Complement fixation reaction (Bordet-Gengou test) becomes positive after 3-4 weeks since the onset of the disease and can be positive during 10 years, which excludes its use for

	the diagnostics of gonorrhea and recent forms of gonorrhea and in case of control of healing. *Topical diagnostics* is performed to determine the localization of the inflammatory process. Two-glass Thompson's test, urethroscopy, the prostate and seminal vesicles status examination with microscopy of their secretion, ultrasonography are applied in men. *The Thompso`n s test* is a simple and quite informative method for differentiating variants of urethral lesions and diagnostics of complications. Turbidity of the first portion of urine and of transparency of a second portion indicates the presence of anterior urethritis. More total urethritis is characterized by the turbidity of both portions of urine. The change of the second portion of urine may also be a sign of the disease of the prostate, seminal vesicles. The exact topic diagnostic of inflammatory changes in the urethra is carried out with urethroscopy. This methodology is used only for chronic forms of the disease and torpid course of gonorrhea, as in case of acute forms there exists the risk of ascending infection. With help of urethroscopy the presence of soft or hard infiltrate in the urethra, the presence of littritis, morganite and colliculitis is established, and the necessity and scope of topical treatment is considered. In women, changes in the cervix and vagina are determined by means of colposcopy, in order to avoid damage of the uterus and appendages *bimanual and ultrasound examination* is performed, rectoscopy is carried out in case of indications. **Treatment.** The success of treatment of gonorrhea patients depends mainly on the correct etiological and topical diagnosis and timely started therapy. The scope and duration of etiological treatment depend on the period of the disease and the presence of complications. When choosing a medication the possible presence of mixed infections must be taken into account. For the last decades the urgent became the problem of the resistance of N. gonorrhoeae to antimicrobial medicines. Antibiotic, which is prescribed for the treatment of gonorrhea, should ensure clinical efficacy in single dose against all strains of pathogens. The preparations of group of Penicillin are known as the first highly effective treatment of various forms of gonorrhea. Until recently, the preparations of this group were recommended as the antibiotics of choice in the causal therapy of gonorrhea. At the current stage due to increasing prevalence of strains of N. gonorrhoeae, which are resistant to penicillin and its derivatives, the therapeutic use of medicines of this group is possible only in case of proven

	sensitivity of gonococcus to a particular medicine. Currently, the first-line drugs in the causal treatment of different forms of gonorrhea are antibiotics of cephalosporin group. Antibiotics, tetracyclines, macrolides, and azalides are also widely used in the treatment of gonorrhea, particularly in combination with other urogenital infections (gonococci + Chlamydia, myco- and ureaplasma). At the same time, the relevant antibiotics belong to the backup group and are applied only in the case of proven resistance of N gonorrhoeae to penicillins and cephalosporins or in case of their intolerance. Treatment of the patients with localized recent acute and subacute uncomplicated gonorrhea with involvement of the lower genitourinary tract is performed on an outpatient basis with use of antibiotic therapy only. Treatment of the patients with recent torpid or chronic gonorrhea, as well as any other forms of gonorrhea in the presence of complications, is conducted in specialized medical institutions of dermatovenereological profile. Therapy of these forms of the disease, in addition to a causal treatment may include the appointment of immunotherapy, topical treatment, physical therapy after corresponding topical diagnostics. Prior to the administration of antibiotics the serological testing for syphilis of gonorrhea patients must be performed. In case of impossibility of such examination of sexual partners, the serological testing is to be repeated after three months. For the treatment of localized gonococcal infections of the lower genitourinary tract, the following medications are appointed: sodium (potassium) salt of benzyl penicillin (6 million units of activity by intramuscular injection 3 million units in each buttock), novocain salt of benzyl penicillin (4.8 million units single dose), procain penicillin G (6 million units single dose), ceftriaxone (1.0 g single dose), cefotaxime (1.0 g once by intramuscular injection), ciprofloxacin (500 mg single dose orally), ofloxacine (400-800 mg single dose orally), spectinomycin (2.0g single dose). In the cases of mixed gonococcal and trichomonal infection the simultaneous treatment of gonorrhea and trichomoniasis is recommended. In combination of gonorrhea with clamidiosis and mycoplasmosis, the antibiotic therapy is initially performed, aimed at the elimination of N. gonorrhoeae, in particular by benzyl penicillin and then anti-chlamydial and anti-mycoplasma preparations are appointed. Patients with torpid and chronic forms of gonorrhea are recommended

	medicines stimulating the increase of specific and non-specific reactivity of the organism in infection fighting. Gonococcal vaccine is applied as specific immunotherapeutic preparation, and for stimulating non-specific resistance of the organism the preparations are applied, which activate a number of cellular and humoral factors of immune system, such as pyrogenalum, prodigiosanum, methyluracilum and others. The local treatments are combined with other forms of therapy, sometimes they are used to increase the metabolic processes in the affected organs, to enhance the permeability of tissues in the lesion focus, for some aggravation of inflammatory process, and before the appointment of the etiotropic therapy as well. In chronic urethritis, the urethral instillations are carried out with 0.25% silver nitrate solution or 2.1 % sodium Protargolum, 2% oil solution of clorophylliptum, for the treatment session of 6-10 procedures. Vaginal washings are carried out with warm (37-38 ° C) solution of potassium permanganate (1:8000), camomile infusion and other medical means by douching 4 times a day at regular intervals. The vaginal baths are also applied. 20-30 ml of 2.1 % solution or Protargolum or Collargolum is poured through the gynecological speculum, introduced into the vagina. Urethral bougienage is mainly recommended for the treatment of infiltrates located on the mucous membrane of the urethra, the lesion of its glands, narrowing (strictures). For this purpose the metal (curved and straight) and elastic bougies are applied. The procedures are carried out every other day for the treatment session of 10-12 procedures. Ultrasonic bougienage is the most effective in the treatment of urethral strictures. In the treatment of chronic gonorrhea and its complications paraffin- ozokeritotherapy, diathermy, inductotherapy, ionophoresis, mud therapy and other are widely used. Therapy of gonococcal pharyngitis is conducted with the participation of the otorhynolaryngologist. In the treatment of complicated gonococcal infections of the upper and lower parts of the urogenital tract, gonococcal peritonitis, gonococcal infection of **the** musculoskeletal system one of the following treatment schemes is used: ceftriaxonum - 1.0 g by intramuscular or intravenous injection every 24 hours, cefotaximum - 1.0 g by intravenous injection every 8 hours, spectinomycinum - 2.0 g by intramuscular injection every 12 hours, ciprofloxacinum - 500 mg every 12 hours. Intravenous or

	intramuscular administration of one of these preparations must be continued no less than seven days. After negativation of clinical symptomatology, the therapy is continued for 24-48 hours, after that the oral administration of ciprofloxacinum or ofloxacinum is appointed. The treatment is carried out during the period of 14 days; the extension of therapy should be strictly reasoned. Selection of the above-mentioned medicines is carried out considering the data from medical history (allergies, idiosyncrasy), the study results of gonococcus sensitivity to antimicrobial drugs, the patient's age etc. Treatment of pregnant women is carried out at any stage of pregnancy with antibacterial medicines taking into account their possible toxic effects on the fetus. Treatment of children is carried out with the obligatory assistance of pediatrician. Treatment of neonates born by mothers with gonorrhea is performed with the assistance of neonatologists. **Criteria of gonorrhea cure.** Control tests are carried out 10-15 days after the end of treatment. The obligatory bacteriascopical and cultural examination of discharge of material is conducted, a great attention is paid to determining the amount of leukocytes. In case of absence of clinical manifestations and with negative results of laboratory research, the patients are left on the medical observation at and the similar tests are repeated after 1-1.5 months. In women, the material for laboratory examination should be collected 1 -2 days after menstruation, during 2-3 menstrual cycles. If after repeated gonococcal test, the results are negative and gland state is normal, patients are removed from dispensary registration. **Prevention.** Basic principles of prevention of gonorrhea are the timely treatment, the identification of sexual contacts and sources of infection, family members' workup, and cure control. Preventive maintenance must be carried out among the patients with gonorrhea in order to prevent sexual contacts during the infectious period, and it must also be aimed at the reducing probability of re-infection among patients and people with past gonorrhea. For the success of preventive maintenance the close relationship of dermatologists with urologists and gynecologists is required. Explanatory talks and lectures, conducted by the medical staff, the presence of available literature on the prevention of gonorrhea and other infections mostly sexually transmitted in medical institutions are of great concern. Preventive measures lay also in educational

	work among the persons of the risk groups, pregnant women, care workers. In the maternity hospitals for the prevention of neonatal ophthalmitis all children immediately after birth the eyes are instilled twice with 30% solution of sulfacyl sodium. In the preventive maintenance of gonorrhea the important is the ability of a doctor to collect history of the patient sexual life, to properly conduct educative activities, to make recommendations for the prevention of sexually transmitted infections.